CLAIMS

I claim:

1. A vibration restraint configured for mounting on a portable vibratory screed machine powered by an engine including a housing mounted on a frame, the engine being coupled to a drive shaft configured to drive a vibratory assembly, the vibratory assembly being coupled to the frame and a screed plate for surfacing a poured concrete surface, the vibration restraint being configured to reduce vibration of the engine, the vibration restraint being radially spaced from the drive shaft and having a first end and a second end opposite the first end, the first end being coupled to the engine housing and the second end being coupled to the platform assembly.

2. The vibration restraint of claim 1, further comprising

a flange disposed at the second end of the restraint, the flange having openings configured to receive fasteners coupling the flange to the frame.

3. The vibration restraint of claim 2, wherein the restraint includes openings disposed at the first end to receive fasteners coupling the first end to the engine housing.

4. The vibration restraint of claim 3, wherein a portion of the restraint is shaped to generally conform to a contour of a portion of the engine housing to which the restraint is attached.

5. The vibration restraint of claim 4, wherein the restraint is configured to restrain vibration in a direction generally parallel to the drive shaft.

6. The vibration restraint of claim 1, wherein the restraint comprises a plate having a flange configured to be coupled to the frame.

7. The vibration restraint of claim 6, wherein the plate includes a first portion that extends from a first end thereof, and a second portion that extends from a second end thereof, the first portion being inclined relative to the second portion.

8. The vibration restraint of claim 6, wherein the drive shaft is enclosed in a shaft housing, and wherein the flange of the plate has a curvilinear shaped cutout to receive the shaft housing.

9. The vibration restraint of claim 6, wherein the engine includes bores configured to receive fasteners coupling the plate directly to the engine housing.

10. A portable vibratory screed machine, comprising:

(A) a machine frame having a reference structure;

(B) an engine including a rotational output and an engine housing being mounted on the reference structure via a mount that surrounds a drive shaft that is rotationally coupled to the engine output;

(C) a vibratory assembly located remote from the engine, the vibratory assembly being driven to vibrate by the drive shaft; and

(D) a vibration restraint configured to restrain vibration of the engine, the vibration restraint directly coupling the engine housing to the reference structure at a location that is spaced apart from the mount.

11. The portable vibratory screed machine of claim 10, wherein the reference structure includes a mount plate on which the engine mount is supported, and wherein the restraint has a first end attached to the engine housing and a second end terminating in a flange that is configured to receive fasteners coupling the flange to the mount plate.

12. The portable vibratory screed machine of claim 11, wherein the restraint comprises a plate having first and second ends, the first end being directly coupled to the engine housing and the second end being directly coupled to the mount plate by the fasteners.

13. The portable vibratory screed machine of claim 12, wherein a portion of the plate is shaped to generally conform to a contour of a mating portion of the engine housing.

14. The portable vibratory screed machine of claim 13, wherein the restraint is configured to restrain vibration in a direction generally parallel to the central axis of the drive shaft independent of the drive shaft.

15. The portable vibratory screed machine of claim 10, wherein, when the engine operates at a speed of 5,000 to 6,000 rpm, the vibration restraint is operable to at least double an operational life of the engine relative to an engine of the same portable vibratory screed machine without a vibration restraint.

16. The portable vibratory screed machine of claim 15, wherein the vibration restraint is operable to quadruple a life of the engine.

17. The portable vibratory screed machine of claim 10, wherein, when the engine operates in a range of 5,000 to 6, 000 rpm, the vibration restraint is operable to reduce engine vibration by at least forty percent.

18. The portable vibratory screed machine of claim 10, wherein, when the engine operates in a range of 5,000 to 6, 000 rpm, the vibration restraint is operable to reduce engine vibration by at least twenty-five percent.

19. The portable vibratory screed machine of claim 10, wherein, when the engine operates in a range of 5,000 to 6, 000 rpm, the vibration restraint is operable to extend a life of the engine to at least 200 operating hours.

20. The portable vibratory screed machine of claim 10, wherein the vibrating restraint comprises a metal plate having first portion and a second portion, the first portion being inclined relative to the second portion, and a flange coupled to the second portion and

having openings configured to receive fasteners coupling the flange to the reference structure.

21. A method of extending a life of an engine having a drive shaft configured to drive a portable vibratory assembly mounted on a reference structure of a portable vibratory screed machine, the method comprising the acts of:

operating the engine to drive the vibratory assembly to generate vibrations; and

restraining the engine relative to the vibratory assembly in a direction generally parallel to a central axis of the drive shaft.

22. The method of claim 21, wherein the act of restraining includes reducing vibrational movement of the engine by at least 40 percent relative to operating the same portable vibratory machine without perform the act of restraining.

23. The method of claim 21, wherein the act of restraining includes providing a restraint having a first end and a second end, coupling the first end of the restraint to the engine, and coupling the second end of the restraint to the reference structure.